



# Urban Short-Range Interaction

A Live/Virtual/Constructive Case

Tijmen Joppe Muller





# Agenda

- Project goal
- Requirements
- Work in progress
- Discussion & questions



# Urban Operations

- Major part of current expeditions
- Challenging environment
- Winning hearts & minds
- Intentions of locals may be unclear
- Experienced soldiers are essential for success





# Training for Urban Operations

- Live training facilities and shoot-houses
- Focus on procedures, low responsiveness
- Assessment and decision making in complex situations and under stress  
→ experience is essential
- Focus on shoot/no-shoot decision





# Simulation of Role Players

- One of three cases in LVC research programme
- Integration of a live room with virtual entities
  - Solves need for role players
  - Full control
  - Variety in scenarios
  - More dynamic than current shoothouses
- Virtual representation of live data and vice versa



# Requirements

- Live environment
  - Position and stance → tracking system
  - Direction of gaze → idem or dedicated sensor
  - Use of equipment → instrumented equipment
  - Non-verbal and verbal communication → tracking and speech recognition systems
- Virtual environment
  - Various entities/objects → 3D simulation
  - Underlying behaviour → JADDEX BDI system
  - Non-verbal and verbal communication → 3D simulation, beamer, audio system



# User requirements

- Non-intrusive systems
- Integrate into existing systems (e.g. MCTC)
- Mobile system to allow quick training set-up
- Damage-proof



# System overview





# Scenario design

- Determine relevant cues for decision making, e.g.
  - Appearance of person (sex, physique, clothing)
  - Number of persons or presence of animals
  - Position and movement of hands
  - Environment (field of view, windows, blocking objects)





# VBS2 as Virtual Environment

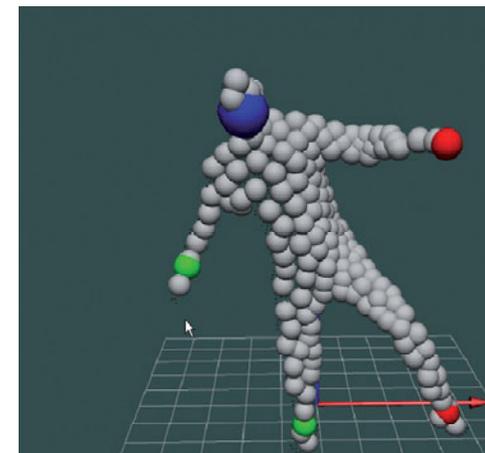
- Growing collection of relevant content
- Easy-to-use editor, relatively 'open'
- Small collection of animations
- Simple behavior models  
→ use of BDI (JADEX)





# Tracking system

- Microsoft Kinect (NITE/OpenNI)
- SoftKinetic
- Wii
- Instrumented weapon
  
- Position and stance
- Orientation
- Gesture
- Multiple persons





# Speech recognition system

- Relatively large room, excited voice
- Small set of utterances
- Julius
- Loquendo





# Related research and systems

- Infantry Immersive Trainer
- Flatworld Immersive Environment (ICT)





# Pros and cons

- No physical interaction possible between role player and student



# Discussion & questions

**See our demonstration!**